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ABSTRACT

Radical advancements in Internet technology over the last decade have created endless opportunities to expand the realm of the elementary classroom. The World Wide Web (WWW), e-mail, newsgroups, and Internet Relay Chat (IRC) are four of the most prominent utilizations of Internet technology. This paper demonstrates how one suburban mid-western elementary classroom has enhanced its curriculum and improved classroom interaction by maximizing Internet technology. In addition to reviewing the merits of this case study, the paper also: (1) presents the rationale for utilizing Internet technology with existing curricula; (2) examines the current debate on the issue of networking schools; (3) compares and contrasts the pros and cons of utilizing Internet technology in elementary classrooms; and (4) considers the coalescence of curriculum and technology. An overview regarding the current application of Internet technology in an elementary setting highlights its true benefits: students conducting research on a topic of their interest, communication and collaborative projects between students around the world, and the opportunity for students to publish original work. (Contains 16 references.) (Author/SWC)

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# "Enhancing Elementary Curricula through Internet Technology"

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Abstract

Radical advancements in Internet technology over the last decade have created endless opportunities to expand the realm of the elementary classroom. The World Wide Web (WWW), E-Mail, Newsgroups, and Internet Relay Chat (IRC) are four of the most prominent utilizations of Internet technology. This paper demonstrates how one mid-western, suburban elementary classroom has enhanced its curriculum and improved classroom interaction by maximizing Internet technology. In addition to reviewing the merits of this case study, the reader will also: (a) be presented with a rationale for utilizing Internet technology with existing curricula, (b) exam the current debate on the issue of networking schools, (c) compare and contrast the pros and cons of utilizing Internet technology in elementary classrooms, and (d) consider the coalescence of curriculum and technology. An overview regarding the current application of Internet technology in an elementary setting highlights its true benefits: students conducting research on a topic of interest, communication and collaborative projects between students around the world, and the opportunity for students to publish original work.

## Technology and Cognition

Tremendous enthusiasm presently exists toward the networking of school classrooms and the coalescence of curriculum and technology. While many critics have labeled this current educational trend as nothing more than an "expensive infatuation with the Internet" (Banks & Renwich, 1997), others view this emerging technology as an opportunity to motivate students to participate in the learning process.

Over the years, educational theorists have recognized the role technology plays in fostering human intelligence. David Olson (1976) noted that "intelligence is not something we have that is immutable: it is something we cultivate by operating with a technology, or something we create by inventing a new technology." This view can be summarized by saying that the role of technology is to act as both an extension of, and a stimulus to, human cognition (Sewell, 1995). Seymour Papert's work, culminating in his influential book Mindstorms, visualized a role for computers and technology that emphasized "breaking down the barriers that frequently exist between differing areas of the curriculum, as revolutionizing the nature of learning, and as lowering the threshold of the abstract" (Papert, 1980). If the current application of Internet technology is only viewed by the elementary teacher as a means of providing remediation and enrichment, a tremendous opportunity to challenge young mind's will be lost. "Classroom computers can change children's minds, but to do so they need to be used by teachers who do not view computers as surrogate teachers so much as tools with which their own educational goals can be reached" (Underwood & Underwood, 1990).

Nora Sabelli, of the National Science Foundation, said it best, "The Net's main value will be breaking the isolation of the classroom by allowing children to talk to experts, exchange ideas, and tap into real time information" (Kronholz,

1997). This attitude reflects a growing rationale toward utilizing such technology in an elementary setting. Without doubt, Internet technology has the potential to serve as the mediating factor between the learning environment and the acquisition of human intelligence.

## Case Study of a Mid-Western Suburban Elementary School

A case study was conducting during the 1996 - 1997 school year in a rapidly growing mid-western, suburban elementary school. The case study specifically examined a fifth grade classroom that was utilizing Internet technology to complete a variety of classroom projects. The school selected for this study is one of six elementary schools networked to both a middle school and high school within the school district. The school district budgeted and completed a massive capital improvement project that involved networking all of the school buildings. This project included the purchase of a network file server, as well as, contracting the installation of fiber optic cable between all buildings within the district. The school examined in this study was outfitted with two, thirty-unit computer laboratories that utilize Macintosh Power PCs. Both laboratories were equipped for Internet applications, in addition to providing an Internet connection for each classroom computer (one per room).

A survey conducted at the beginning of the school year revealed that sixty-four percent of the students assigned to this classroom had previous experience with the Internet. Forty-three percent indicated that they had access to the Internet in their home, while only twenty-five percent of this group indicated that they had previously used the Internet to complete research on a school project. Eleven percent of the students from this classroom indicated that they had no prior knowledge of the Internet and were being introduced to Internet technology for the first time.

The teacher involved with this case study received extensive training in educational technology as a preservice teacher. However, the preservice training was void of any Internet experience. The teacher indicated that Internet experience was acquired through personal interest, beginning with the teacher's enrollment through an Internet Service Provider (ISP) in October of 1995. Since that time, the teacher had completed some formalized training related to Internet technology.

Some of the applications observed during the study included: (a) utilizing a variety of Internet search engines to retrieve biographical information on notable individuals of the twentieth century, (b) downloading a variety of images to be printed in color and later displayed in a student project, (c) accessing weather satellite images to make predictions regarding the daily weather forecast, (d) linking to a variety of educational sites that provided specific information regarding both social studies and science topics (e.g., Colonial America, global warming, etc.), and (e) sending and retrieving email (e.g., electronic pen pals). Prior to being allowed to utilize any Internet application, students had to complete a school permission slip (that was signed by a parent) acknowledging that the school district's policy regarding Internet access had been reviewed with the child.

Tremendous enthusiasm was noted in regard to students completing research on assigned topics. Many students, who earlier demonstrated a dislike for completing research, were extremely active in the retrieval of information related to a specific topic being discussed in class. A small percentage of students found the exercise to be frustrating and opted for a more conventional approach to completing their research (i.e., utilizing an encyclopedia).

While the overall effectiveness of applied Internet technology is inconclusive in this case study, there were several positive benefits noted. The majority of students were actively engaged in research for an extended period of time. Students

displayed an ability to work independently of the teacher, requiring only minimal assistance while conducting "Web" searches. Finally, students were able to incorporate much of the information gained from their Internet search into a final written report (i.e., a biography of a notable person from the twentieth century).

## The Current Debate on Internet Technology

The debate over networking schools and providing Internet access to all students is complicated by a number of political and economical issues. President Clinton recently escalated the debate by committing fifty-seven million dollars toward "technology literacy grants", aimed at assisting poor school districts that lack the fiscal resources required to "hard wire" their buildings. The Clinton Administration has also pressured the Federal Communications Commission (FCC) to "establish a 2.25 billion dollar Universal Service Fund, which will link schools across the country to the Internet beginning in 1998." (Associated Press, 1997) President Clinton has further promulgated Internet access in schools by encouraging school districts to consider volunteer labor as an alternative to contracting the labor required to hard wire a building. Clinton views such a community effort as "an old-fashioned barn raising [when] neighbor joins with neighbor to do something for the good of the entire community." (McAllister, 1997)

Critics are quick to point out that regardless of the amount of money offered through federal and state agencies, the Internet will remain only a promise, and not the panacea that people predict. Critics point to a National Study conducted by the Rand Corporation of Santa Monica, California. The Rand Corporation concluded that there was no significant evidence to justify "networking" all of the nation's schools and that computers as a whole "remain marginal contributors in most schools". Sandra Banks and Lucille Renwich (1997) noted three obstacles to achievement: (a) a high price tag, (b) lack of teacher training, and (c) no consensus

on best use. In a June 8, 1997 article appearing in the Los Angeles Times, Banks and Renwich noted that only a small percentage of successful, Internet equipped schools exist. One such school, Blackstock Junior High School in Ventura County, California has shown tremendous success in student achievement attributed directly to the coalescence of technology and curriculum. This success is marred by the tremendous cost associated with their success. For example, Blackstock Junior High School invested three billion dollars over a ten year period. During this time, teachers were given a year off to receive training in the appropriate application of Internet technology and the school's curriculum was completely overhauled to included Internet requirements. To maintain their success, the Blackstock Junior High School currently operates with a technology budget in excess of $380,000 a year. (Banks and Renwich, 1997).

The outcome of this debate is undecided. Many leaders in the field of education question whether the enormous cost to provide the hardware required for Internet technology is really worth the investment. Adding to the enormous price tag is the realization that only five percent of current funding goes toward training teachers in the use of this technology. Only eighteen states presently require preservice teachers to receive training in Internet technology, and of these eighteen, only five require that veteran teachers receive training prior to renewing their teaching license (Wall Street Journal, 1997). Without conclusive evidence on the effectiveness of Internet technology in the elementary classroom, many educators question whether money is being wasted on an expensive experiment. Nevertheless, Stuart Biegel, Professor of Education and Information Studies at the University of California, Los Angeles (UCLA), poses an interesting question: "It is a step into the unknown, no question about it. So the question is, do we take the step or do we sit back and let somebody else do it?" (Banks and Renwich, 1997)

Biegel's remarks demonstrate the reality that supersedes any debate. Internet technology is here to stay. It will continue to work its way into the elementary classroom and curriculum. Rather than wasting time debating its cost effectiveness or its merit as an instructional tool, the debate should be muted in favor of developing this emerging technology into an effective teaching tool.

## Implications for the Future

A review of educational research leads one to conclude that the true obstacle to realizing successful integration of Internet technology and elementary curricula lies in the fact that "past staff development programs have not focused on the specific instructional computer skills needed by teachers to integrate the Internet into classrooms." (O'Donnell, 1996).

In her book, Integrating Computer Into the Classroom, Edith O'Donnell notes the need for "a new philosophy". This new philosophy must fulfill three purposes: (a) recognize that just placing computers with Internet access into classrooms is not adequate for integration, (b) recognize that teachers wish to integrate Internet technology, but do not know how, and (c) recognize that present in-service programs are inadequate for widespread integration of Internet technology into the classroom. Teachers must gain the necessary instructional strategies to go beyond hands-on computer skills to teacher-driven instructional strategies that provide confidence and enthusiasm to inspire utilization of Internet technology in a whole class environment. (O'Donnell, 1996)

## Summary

The marriage of Internet technology and elementary curricula holds the potential to change the way students look at learning. Teachers and their students need to move from planned learning to authentic experiences; Internet technology provides the means by which we can influence that change. Internet technology,

properly applied, holds the potential to help students not only to prepare and complete assignments, but integrate experience and subject matter. Used properly, the Internet can act as a stimulus for the discussion and exchange of ideas. The Internet can also provide for individualized instruction, an ideal that educators continually advocate. Finally, the Internet encourages interactivity, promoting active learning between students of all ages and abilities. The Internet is not just a technology for presenting material to be learned, nor is it just an outlet for students to express themselves, although both of these are roles the Internet can fulfill. It is both these and more. With the appropriate application of Internet technology, the elementary curriculum can be responsive to differing learner characteristics, can provide authentic opportunities for application, and can motivate students to learn.

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